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EXAMINER	
CHEN, WENPENG	
ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/053,488	MCKINLEY ET AL.	
	Examiner	Art Unit	
	Wenpeng Chen	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,4,14-24,26-30 and 32-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,4,14-24,26-30,32-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/22/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/8/2005 has been entered.

Examiner's responses to Applicant's remark

2. Applicants' arguments with regard to objection to specification related to incorporation by references, filed on 12/8/2005, have been fully considered. The Applicants argued that incorporation by references must meet the requirement of 35 U.S.C. Section 112 for at least one claim. The Applicants alleged that the Examiner did not identify a particular claim. As pointed out in the previous Action, segmentation is a key feature recited in claims. For example, segmentation is recited at least in Claims 2, 4, and 18. If the Applicants consider that the references at issue contain no essential materials, they can replace the phrase "incorporation by references" in other forms. With the changes, the Examiner would consider the papers to be general references and withdraw the objection. Otherwise, the Examiner does and will maintain that the incorporation is improper.

3. Applicants' arguments with regard to prior-art rejections, filed on 12/8/2005, have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes that the cited reference to reasonably and properly meet the claimed limitations.

a. Applicants' argument -- With regard to Claim 2, Vynne does not prioritize blocks based on the visibility criteria prior to distributing them to parallel processors prioritization process.

Examiner's response -- The Examiner disagrees. In the section from column 24, line 64 to column 25, line 11 that explains Fig. 6.1, Vynne teaches selecting a subset U(n) of blocks suitable for watermarking coding. In this process, the blocks in a frame are prioritized as suitable blocks and unsuitable blocks. In the section of column 27, lines 7-18, Vynne further teaches "the blocks" are divided between different processors for watermarking. Because only suitable blocks are watermarked, "the blocks" are referred only to suitable blocks. Therefore, Vynne indeed teaches the amended limitation "distributing the prioritized segments to parallel processors after analyzing of the media signal to prioritize the segments." The followings further support the Examiner's position:

-- Passage in column 32, lines 18-33 teaches that CRAY T3D 710 is used for parallel processing to achieve a near time real time embedding speed. The number of watermark-coded blocks is optimized to maintain image quality. While an image may be processed in parallel by several processing components, the quality of an image shall be evaluated as a whole. Therefore, the blocks suitable for signature-encoding are determined before distributing them to different PE's.

-- The watermark system 700 follows the block diagrams in Fig. 6.1 and 6.2. (Column 27, lines 7-9) The selection (prioritization) is performed before watermarking and therefore before parallel watermarking process.

Applicants are reminded that the Examiner is entitled to give the broadest reasonable interpretation to the language of the claims. So the Examiner considers the process of selecting suitable blocks (two-states prioritization) to be Applicants' prioritization process within the broad meaning of the term. And prioritization process is performed before parallel watermarking process. The Examiner is not limited to Applicants' definition which is not specifically set forth in the claims. In re Tanaka et al., 193 USPQ 139, (CCPA) 1977.

b. Applicants' argument -- With regard to Claim 4, Vynne fails to teach; "the media signal segments are prioritized such that segments that are more likely to carry a readable watermark signal are given higher priority for the embedding operations" as set forth in claim 4. Selecting suitable blocks has nothing to do with the likelihood that those blocks will carry a readable watermark signal. Vynne fails to teach watermarking according to the priority order.

Examiner's response -- As pointed out in the cited passages of Vynne, the suitable blocks are selected based on criterion related to energy level of a block. It is clearly stated that from V(n)* the subset U(n)* can be extracted for extracting watermarking signal. More reliably U(n)* are extracted, more likely those blocks will carry a readable watermark signal. The cited passage in column 33 teaches another way of selecting process based on a key to make a watermark more readable under attack. Again, the Examiner considered labeling a block "suitable" or "non-suitable" is a prioritization process. With regard to the limitation related to priority order, please see the response to Claim 2 above.

c. Applicants' argument -- With regard to Claims 18-19, Vynne fails to teach; "the media signal is segmented and prioritized for parallel watermark decoding operations based on probability of watermark detection".

Examiner's response -- Vynne's passage from column 22, line 22 to column 24, line 58 teaches that watermarking is based on selection of blocks and probability coding model. Therefore, the decoding of watermarking also depends on probability of watermark detection. For example, blocks are divided into groups each has power of two size for B.R.S. coding. Thus the number of blocks to be selected is based on probability of watermark detection.

Claim 18 requires the combined action of segmentation and prioritization is based on probability of watermark detection. Because the segmentation is based on probability of watermark detection, the combined action is also based on the probability.

d. Applicants' argument -- With regard to Claims 20-22, Vynne fails to teach the feature recited in the claims because each processing unit in Vynne's system performs the same embedding function in parallel.

Examiner's response -- Vynne's column 27, lines 7-18 teaches that blocks are divided and watermarked. As shown in other sections, a watermark contains a series of bits of "0" and "1". Each bit is encoded in a block. Because the bits of a watermark are distributed among the divided groups of blocks, each group has a portion of bit sequence different from that of other group. The watermark embedding in each group and therefore in each processor are thus different. Furthermore, the number of selected blocks for watermarking a PE can be different (column 27, lines 17-18.)

For Claim 21, it does not require that two modules cannot perform steps in the same subsystems listed in Claim 21.Unless the Applicants further specify their different watermarking functions, the Examiner considers the feature was taught.

e. Applicants' argument -- With regard to Claims 23-24 and 26-28, the cited art fails to teach the claimed re-use of a perpetual mask.

Examiner's response -- In the passages cited in the previous Action, the criteria thresholds are considered as mask. Once the mask is established, it is used for subsequent frames. Therefore, the perpetual mask is re-used again and again for many frames.

f. Applicants' argument -- With regard to Claims 2, 14, 20, 22, 29-30, 32-33, and 16-17, Hawkins fails to teach sub-dividing the media object into segments, because the object is an image and Hawkins does not divide image.

Examiner's response -- The Examiner disagrees. Without explicitly defining a media object, a media signal is a media object. Changing "signal" to "object" does not change the claimed scope. As cited in column 9, lines 10-25, column 10, lines 22-61, and column 12, lines 17-39 of Hawkins, the media signal is divided based on jobs, each job is a segment of media signal.

Applicants are reminded that the Examiner is entitled to give the broadest reasonable interpretation to the language of the claims. So the Examiner considers the process of separating media signal into data segments related to job segments to be Applicants' sub-dividing process within the broad meaning of the term. The Examiner is not limited to Applicants' definition which is not specifically set forth in the claims. In re Tanaka et al., 193 USPQ 139, (CCPA) 1977.

g. Applicants' argument -- With regard to Claim 15, Hawkins fails to teach the feature related to the use of a memory unit used to swap data as recited.

Examiner's response -- The Examiner presented his point about Hawkins' teaching of the feature. The Applicants fail to point out explicitly why the Examiner's interpretation does not match the recited feature.

h. Applicants' argument -- With regard to Claim 34, Shinoda fails to teach any form of a batch watermark registration and embedding system.

Examiner's response -- As cited by the Examiner, Shinoda at least teaches processing Web *pages* including watermarking in column 3, lines 7-50. Shinoda processes the group of Web pages one at a time within a job. As long as, the pages are grouped as a job, it is a batch of files. The process for the Web pages is considered a batch watermarking process. Each page of the group is then segmented and watermarked in parallel as taught by Vynne. Without specifically further limiting the feature, a batch watermark registration and embedding system is one that can also watermark several pages in a batch fashion based on job assignment.

Applicants are reminded that the Examiner is entitled to give the broadest reasonable interpretation to the language of the claims.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for the following reasons.

There are insufficient antecedent bases for the following limitations.

-- Claim 4 recites the limitation "the prioritized segments" in line 5.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 2, 4, 14-15 are rejected under 35 U.S.C. 102(a) as being anticipated by Debes et al. ("Watermarking Scheme for Large Images Using Parallel Processing," Debes, E. et all., Security and Watermarking of Multimedia Contents III," Proceedings of SPIE, Vol. 4314, pages 26-34, 22-25 Jan. 2001 listed in IDS.)

a. The Examiner checked the contents of the two CIP applications and provisional application, and concluded that all the above-listed documents do not support the above-listed claim(s). Therefore, the effective invention date for the above-listed claim(s) is the filing date of the present application, 11/2/2001. Therefore, Debes paper is a 102(a) reference.

b. Debes teaches a method of segmenting a media object for parallel watermarking operations, the method comprising

for Claim 2

-- sub-dividing the media object into segments, including analyzing the media object to prioritize segments of the media object for digital watermark operations on the segments, wherein the media object segments are prioritized for digital watermark embedding operations; (sections 2.1, 2.3, and 2.4; The image is divided into tiles for watermarking.)

-- distributing the prioritized segments to parallel processors prioritization process after the analyzing of the media object to prioritize the segments; (sections 2.1, 2.3, and 2.4; The tiles are ranked according to their importance.)

-- performing parallel digital watermark operations on the prioritized segments in the parallel processors according to the priority order of the prioritized segments. (sections 2.1, 2.3, and 2.4; Only the most significant tiles are watermarked.)

for Claim 4

-- sub-dividing the media signal into segments; (sections 2.1, 2.3, and 2.4; The image is divided into tiles for watermarking.)

-- distributing the segments to parallel processors; (sections 2.1, 2.3, and 2.4; The tiles are distributed to several processors for parallel processing.)

-- performing parallel digital watermark operations on prioritized segments in the parallel processors after the analyzing of the media object to prioritize the segments: including analyzing the media signal to prioritize segments of the media signal for digital watermark operations on the segments, wherein the media signal segments are prioritized for digital watermark embedding operations and wherein the media signal segments are prioritized such that segments that are more likely to carry a readable watermark signal are given higher priority for the embedding operations; (sections 2.1, 2.3, 2.4, 3.1; The tiles are ranked according to their importance. Only the most significant tiles are watermarked. The first sentence in page 31 indicates that tiles are selected to provide strongly-embedded watermarks that are more likely to carry a readable watermark signal during decoding.)

for Claims 14-15

-- sub-dividing the media object into segments; (sections 2.1, 2.3, and 2.4; The image is divided into tiles for watermarking.)

-- distributing the segments to parallel processors; (sections 2.1, 2.3, and 2.4; The tiles are distributed to several processors for parallel processing.)

-- performing parallel digital watermark operations on the segments in the parallel processors wherein the media object is segmented into blocks based on a memory parameter of processing hardware, and the memory parameter comprises a unit of memory used to swap data into system memory in a virtual memory system; (Page 29; The division into tiles is based on the a memory parameter such as the size of the L2 cache that is considered as the unit of memory.)

8. Claims 2, 4, 18-24, and 26-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Vynne et al. (US patent 5,960,081.)

a. Please also see the Examiner's responses above.

b. Vynne teaches a method of segmenting a media object for parallel watermarking operations, the method comprising

for Claim 2

-- sub-dividing the media object into segments, including analyzing the media object to prioritize segments of the media object for digital watermark operations on the segments, wherein the media object segments are prioritized for digital watermark embedding operations; (column 24, line 65 to column 25, line 11; Fig. 6.1; column 27, lines 7-18; The images are divided into blocks. A subset U(n) of blocks suitable for coding is selected using the selection criteria discussed from column 17, line 54 to column 22, line 21. The selection process is a prioritization process.)

-- distributing the prioritized segments to parallel processors prioritization process after the analyzing of the media object to prioritize the segments; (Fig. 7.2; column 26, line 1 to column 27, line 18; Fig. 7.2 shows the parallel processors. A group of B_{pe} blocks is sent to each processor. Also see the Examiner's response above.)

-- performing parallel digital watermark operations on the prioritized segments in the parallel processors according to the priority order of the prioritized segments; (column 10, lines

32-48; Fig. 7.2; column 26, line 1 to column 27, line 18; There are only two priority order: suitable and non-suitable.)

for Claim 4

-- sub-dividing the media signal into segments; (Fig. 6.1; column 27, lines 7-18; The images are divided into blocks.)

-- distributing the segments to parallel processors; (Fig. 7.2; column 26, line 1 to column 27, line 18; Fig. 7.2 shows the parallel processors. A group of B_{pe} blocks is sent to each processor.)

-- performing parallel digital watermark operations on the prioritized segments in the parallel processors after the analyzing of the media object to prioritize the segments: including analyzing the media signal to prioritize segments of the media signal for digital watermark operations on the segments, wherein the media signal segments are prioritized for digital watermark embedding operations and wherein the media signal segments are prioritized such that segments that are more likely to carry a readable watermark signal are given higher priority for the embedding operations; (column 10, lines 32-48; Fig. 7.2; column 26, line 1 to column 27, line 18; column 24, line 65 to column 25, line 11; Fig. 6.1; column 27, lines 7-18; The images are divided into blocks. A subset U(n) of blocks suitable for coding is selected using the selection criteria discussed from column 17, line 54 to column 22, line 21. The selection process is a prioritization process. column 8, lines 25-35; The blocks are selected based on energy of a block to generate more-likely readable watermark signal.; column 33, lines 19-23; The blocks can be selected also based on a secret key to generate more-likely readable watermark signal, when the watermark is under attack.)

for Claims 18-19

-- sub-dividing the media signal into segments; (Fig. 6.1; column 27, lines 7-18; The images are divided into blocks.)

-- distributing the segments to parallel processors; (Fig. 7.2; column 26, line 1 to column 27, line 18; Fig. 7.2 shows the parallel processors. A group of B_{pe} blocks is sent to each processor.)

-- performing parallel digital watermark operations on the segments in the parallel processors (column 10, lines 32-48; Fig. 7.2; column 26, line 1 to column 27, line 18) wherein the media signal is segmented and prioritized for parallel watermark decoding operations based on probability of watermark detection; (column 22,line 22 to column 24, line 58)

-- wherein the parallel processors comprise threads of execution on one or more hardware processing units; (column 26, lines 57-68; Each segment is processed separately and then combined.)

for Claims 20-21

-- sub-dividing the media signal into segments; (Fig. 6.1; column 27, lines 7-18; The images are divided into blocks.)

-- distributing the segments to parallel processors; (Fig. 7.2; column 26, line 1 to column 27, line 18; Fig. 7.2 shows the parallel processors. A group of B_{pe} blocks is sent to each processor.)

-- performing parallel digital watermark operations on the segments in the parallel processors (column 10, lines 32-48; Fig. 7.2; column 26, line 1 to column 27, line 18) wherein the watermark operations are performed by two or more watermark operation modules that

perform a different watermarking task, and the watermark operation modules operate in parallel such that a watermarking task foe the media signal is distributed over the watermark operation modules performing different watermark functions on the media signal in parallel; (Fig. 7.2; column 10, lines 32-48; Fig. 7.2; column 26, line 1 to column 27, line 18; Also see the above Examiner's responses.)

-- wherein the watermark operation modules comprise a watermark generator, a perceptual analyzer and a watermark applicator. (Fig. 6.1; The part generating the signature is a watermark generator. "Criteria 612" is a perceptual analyzer. Embedder 618 is a watermark applicator. Each PE of Fig. 7.2 has the set shown in Fig. 6.1.)

c. For Claim 22, Vynne further teaches computer readable medium on which is stored instructions for performing the method of claim 20. (column 26, lines 1-54; column 27, lines 27-58; The instructions are stored in memory inside CRAY computer.)

d. Vynne teaches a distributed digital watermark embedder comprising:

for Claims 23-24 and 26-28

-- a watermark signal generator for generating a watermark from a message; (column 1, lines 43-51; Fig. 6.1; column 9, lines 45-59; The part generating the signature is a watermark generator. The signature is related with author of a document or other information which is a message. The final watermark is generated from the signature.)

-- a perceptual analyzer for perceptually analyzing a media signal and generating perceptual control parameters used to control application of the watermark to the media signal;

(Fig. 6.1; "Criteria 612" is a perceptual analyzer. A subset U(n) of blocks suitable for coding is selected using the selection criteria based on perceptual analysis discussed from column 17, line 54 to column 22, line 21.)

-- a watermark applicator for receiving the media signal, the watermark and the perceptual control parameters, and for applying the watermark to the media signal according to the perceptual control parameters; wherein the watermark signal generator, the perceptual analyzer and the watermark applicator operate on distributed processors, wherein the distributed processors comprises independent threads of execution (Fig. 6.1; Fig. 7.2; column 10, lines 32-48; Fig. 7.2; column 26, line 1 to column 27, line 18; Embedder 618 is a watermark applicator. Each PE of Fig. 7.2 has the set shown in Fig. 6.1.) wherein variable watermarks are embedded in copies of a media signal by executing the perceptual analyzer on the media signal once to generate a perceptual mask that is re-used by the watermark applicator to apply different watermarks from the watermark signal generator to the copies; (column 17, line 54 to column 22, line 22; column 27, line 59 to column 28, line 10; The criteria thresholds as those listed in column 22, lines 1-9 are the mask that is used for selecting blocks for watermarking. The thresholds are adjusted based on perceptual analysis through direct view.)

-- including a media signal segmentation processor for sub-dividing a media signal into segments for parallel processing in the embedder, wherein the embedder includes plural perceptual analyzers, which operate in parallel on segments of the media signal and wherein the embedder includes plural watermark signal applicators, which operate in parallel on segments of the media signal. (Figs. 6.1 and 7.2; column 27, lines 7-18; The images are divided into blocks. The part generating the signature is a watermark generator. "Criteria 612" is a perceptual

analyzer. Embedder 618 is a watermark applicator. Each PE of Fig. 7.2 has the set shown in Fig. 6.1.)

9. Claims 2, 14-15, 20, 22, 29-30 and 32-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Hawkins et al. (US patent 6,389,421.)

a. Please also see the Examiner's responses above.

b. Hawkins teaches a method of segmenting a media object for parallel watermarking operations, the method comprising:

for Claim 2

-- sub-dividing the media object into segments, including analyzing the media object to prioritize segments of the media object for digital watermark operations on the segments, wherein the media object segments are prioritized for digital watermark embedding operations; (column 9, lines 10-25; column 10, lines 22-61; column 12, lines 17-39; The media signal is divided based on jobs.; column 10, lines 4-62; The segments are prioritized based on the user of the media signal to set a schedule.)

-- distributing the prioritized segments to parallel processors prioritization process after the analyzing of the media object to prioritize the segments; (column 6, lines 26-34; column 12, lines 17-39; A single number of watermarking process is assigned per available processor.)

-- performing parallel digital watermark operations on the prioritized segments in the parallel processors according to the priority order of the prioritized segments. (column 6, lines

26-358; column 12, lines 17-39; A single number of watermarking process is assigned per available processor.)

for Claims 14-15

-- sub-dividing the media object into segments; (column 9, lines 10-25; column 10, lines 22-61; column 12, lines 17-39; The media signal is divided based on jobs.)

-- distributing the segments to parallel processors; (column 6, lines 26-34; column 12, lines 17-39; A single number of watermarking process is assigned per available processor.)

-- performing parallel digital watermark operations on the segments in the parallel processors (column 6, lines 26-358; column 12, lines 17-39; A single number of watermarking process is assigned per available processor.) wherein the media signal is segmented into blocks based on a memory parameter of processing hardware, and the memory parameter comprises a unit of memory used to swap data into system memory in a virtual memory system; (column 10, lines 40-44; column 12, lines 25-39; The segment requested for a subsequent watermarking process depends on data-size-dependent points that is related to the characteristic of storage facility, namely the data size cannot be larger than the storage. The storage is the maximum capacity which data can be swapped for processing.)

for Claim 20

-- sub-dividing the media signal into segments; (column 9, lines 10-25; column 10, lines 22-61; column 12, lines 17-39; The media signal is divided based on jobs.)

-- distributing the segments to parallel processors; (column 6, lines 26-34; column 12, lines 17-39; A single number of watermarking process is assigned per available processor.)

-- performing parallel digital watermark operations on the segments in the parallel processors (column 6, lines 26-358; column 12, lines 17-39; A single number of watermarking process is assigned per available processor.) wherein the watermark operations are performed by two or more watermark operation modules that perform a different watermarking task, and the watermark operation modules operate in parallel such that a watermarking task foe the media signal is distributed over the watermark operation modules performing different watermark functions on the media signal in parallel. (column 6, lines 26-58; column 12, lines 17-39; A single number of watermarking process is assigned per available processor. Also see the above Examiner's responses.)

c. For Claim 22, Hawkins further teaches computer readable medium on which is stored instructions for performing the method of claim 20. (See claim 20 of Hawkins)

i. For Claims 29-30 and 32-33, Hawkins teaches a system for parallel watermark embedding comprising:

-- a media signal pre-processor operable to receive a media object and divide the media object into segments for parallel watermark embedding operations; (column 9, lines 10-25; column 10, lines 22-61; column 12, lines 17-39; The media signal is divided based on jobs.)

-- a server for distributing the segments to parallel processors for parallel watermark embedding operations; (column 6, lines 26-58; column 12, lines 17-39; A single number of watermarking process is assigned per available processor.)

-- wherein the segments are prioritized for embedding operations, wherein the segments are prioritized for embedding operations based on hardware resource constraints; (column 10, lines 4-62; column 11, lines 12-26; The segments are prioritized based on a schedule. The worker thread is performed based on a resource allocation schedule which indicates hardware resource constraints.)

-- a load balancer for distributing segments to the parallel processors based on priority. (column 10, lines 4-62; column 11, lines 12-26; The segments are prioritized based on a schedule. The load balance is based on points allocated to users or size of data.)

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US patent 6,389,421) as applied to Claim 14, and further in view of Peters et al. (US patent 6,374,336.)

Hawkins teaches the parent Claim 14. However, it does not teach the feature related to memory alignment boundary recited in Claim 16.

Peters teaches a method of watermarking:

-- wherein segmenting signals based on a memory parameter that comprises a memory alignment boundary. (column 10, lines 7-30)

It is desirable to process image at the correct division of data to reduce loss or degradation of data. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Peters' teaching to segment Hawkins' data based on memory alignment boundary, because the combination preserves better data quality.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vynne et al. (US patent 5,960,081) in view of Kawaguchi et al. (US patent 6,473,516.)

Vynne teaches the steps of sub-dividing, distributing, and performing recited in Claim 17, as evident in the discussion above related to Claim 4.

However, it does not teach the feature related to bit planes recited in Claim 17.

Kawaguchi teaches a method of steganography which is watermarking:

-- wherein a media signal is segmented and prioritized based on bit plane to reduce the number of bit planes of the media signal subjected to watermarking operations. (column 2, lines 32-40; column 5, lines 26-37; Watermarking is done only on some bit planes.)

It is desirable to increase information hiding capacity in watermarking. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to include Kawaguchi's segmentation and prioritization method in Vynne's watermarking method, because the combination improves information hiding capacity. The combination thus teaches:

-- wherein a media signal is segmented by bit planes and the bit planes are prioritized for watermarking operations in priority order to reduce the number of bit planes of the media signal subjected to watermarking operations.

13. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shinoda (US 6,611,830) in view of Vynne et al. (US patent 5,960,081.)

Shinoda teaches a batch digital watermark registration and embedding system comprising:

-- a network interface for receiving ID registration requests, the requests including a list of media signal files and information to be linked with the media signal files via data embedded in the media signal files; (Fig. 1; column 1, lines 40-46; column 3, lines 7-50; column 5, lines 1-35; Many files, each having an ID, are inputted at least one by one for registration.)

-- a batch registration loader for creating records in a registration database corresponding to identifiers for each of the media signal files; (column 4, line 64 to column 5, line 35; Fig. 5 shows records in the database.)

-- a batch registration extractor for reading the registration database and creating an embedder control file, including identifiers, a corresponding list of media signal files, and embedding instructions for controlling embedding of the identifiers in the media signal files; (column 4, line 64 to column 5, line 35)

-- a digital watermark embedder for performing digital watermark embedding operations on each file to hide the identifiers in the media signal files. (column 4, line 64 to column 5, line 46)

However, Shinoda does not teach the feature related to parallel digital water embedding.

Vynne teaches a system of segmenting a media signal for parallel watermarking operations, comprising:

-- sub-dividing the media signal into segments; (Fig. 6.1; column 27, lines 7-18; The images are divided into blocks.)

-- distributing the segments to parallel processors; (Fig. 7.2; column 26, line 1 to column 27, line 18; Fig. 7.2 shows the parallel processors. A group of B_{pe} blocks is sent to each processor.)

-- performing parallel digital watermark operations on the segments in the parallel processors. (column 10, lines 32-48; Fig. 7.2; column 26, line 1 to column 27, line 18)

It is desirable to speed up watermarking of data files. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use Vynne's parallel watermarking approach in Shinoda's system to perform parallel watermarking for a set of files, because the combination speeds up watermarking and therefore registration process. The combination thus teaches:

-- a parallel digital watermark embedder for segmenting media signal files into segments and for distributing the segments to parallel processors for performing parallel digital watermark embedding operations on the segments to hide the identifiers in the media signal files.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 571-272-7431. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 571-273-8300 for After Final communications. TC 2600's customer service number is 571-272-2600.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Wenpeng Chen
Primary Examiner
Art Unit 2624

May 26, 2006